

What is claimed is:

1. A magnetoresistive effect sensor using a shielded-type magnetoresistive effect element comprising:
 - 5 a magnetoresistive effect film comprising a basic configuration that is either a combination of a free layer, a barrier layer formed on said free layer, and a fixed layer formed on said barrier layer, or a combination of a fixed layer, a barrier layer formed on said fixed layer, and a free layer formed on said barrier layer, wherein a sensing current flows substantially perpendicularly with respect to said magnetoresistive effect film, and wherein either an amorphous material or a microcrystalline material is used in a lower shield layer.
 - 10 2. A magnetoresistive effect sensor according to claim 1, wherein said lower shield comprises a crystal grain diameter of 6.2 nm or smaller.
 - 15 3. A magnetoresistive effect sensor according to claim 1 or claim 2, wherein said lower shield is made of a material of CoZrTa and CoZrTaCr alloy, as a base.
 - 20 4. A magnetoresistive effect sensor according to claim 1, wherein said lower shield is formed by means of sputtering.
 - 25 5. A magnetoresistive effect sensor according to claim 1, wherein a magnetoresistive effect film having a basic configuration that is either a combination of a free layer, a barrier layer formed on said free layer, and a fixed layer formed on said barrier layer, or a combination of a fixed layer, a barrier layer formed on

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said fixed layer, and a free layer formed on said barrier layer is formed on said lower shield directly or formed thereon via an intervening base layer.

6. A magnetoresistive effect sensor according to claim
5 1, wherein a lower conductor layer is disposed at a bottom part of a magnetoresistive effect film having a basic configuration that is either a combination of a free layer, a barrier layer formed on said free layer, and a fixed layer formed on said barrier layer, or a
10 combination of a fixed layer, a barrier layer formed on said fixed layer, and a free layer formed on said barrier layer, a bottom part of said lower conductor layer being in contact with a lower shield.

7. A magnetoresistive effect sensor wherein in a
15 magnetoresistive effect element in which a conductor layer is disposed at a bottom part of a magnetoresistive effect film having a basic configuration that is either a combination of a free layer, a barrier layer formed on said free layer, and a fixed layer formed on said barrier layer, or a combination of a fixed layer, a barrier layer formed on said fixed layer, and a free layer formed on said barrier layer, in contact either with an intervening base layer or directly therewith, wherein said lower conductor layer functions as a lower electrode to cause a
20 sensing current to flow in said magnetoresistive effect film, and further wherein a lower conductor is made of a material selecting from a group consisting of an amorphous material and a microcrystal.

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8. A magnetoresistive effect sensor according to claim 7, wherein said microcrystal forming said lower conductor layer comprises a crystal grain diameter of 5.4 nm or smaller.

5 9. A magnetoresistive effect sensor according to claim 7, wherein said lower conductor layer is formed by sputtering.

10. A magnetoresistive effect sensor according to claim 1, further comprising a layer which fixes a magnetization 10 of a fixed layer, provided so as to be in contact with said fixed layer.

11. A method for manufacturing a magnetoresistive effect sensor whereby a shielded-type magnetoresistive effect element in which a sensing current flows substantially 15 perpendicular to a magnetoresistive effect film, using a magnetoresistive effect film having a basic configuration that is either a combination of a free layer, a barrier layer formed on said free layer, and a fixed layer formed on said barrier layer, or a combination of a fixed layer, 20 a barrier layer formed on said fixed layer, and a free layer formed on said barrier layer, wherein a material selected from a group consisting of an amorphous material and a microcrystalline material is used in a lower shield.

12. A method for manufacturing a magnetoresistive effect 25 sensor according to claim 11, wherein said microcrystal used in said lower shield comprises a crystal grain diameter of 6.2 nm or smaller.

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13. A method for manufacturing a magnetoresistive effect sensor according to claim 11, wherein said lower shield is formed using sputtering.

14. A method for manufacturing a magnetoresistive effect
5 sensor according to claim 11, wherein a magnetoresistive
effect film having a basic configuration that is either a
combination of a free layer, a barrier layer formed on
said free layer, and a fixed layer, or a combination of a
fixed layer, a barrier layer formed on said fixed layer,
10 and a free layer is formed on said lower shield directly
or formed thereon via an intervening base layer.

15. A method for manufacturing a magnetoresistive effect sensor according to claim 11, whereby a lower shield layer is formed and a lower conductor layer is formed on
15 said lower shield layer, and further whereby a magnetoresistive effect film having a basic configuration that is either a combination of a free layer, a barrier layer formed on said free layer, and a fixed layer, or a combination of a fixed layer, a barrier layer formed on
20 said fixed layer, and a free layer formed on said barrier layer is formed on said lower conductor layer, either directly or via an intervening base layer.

16. A method for manufacturing a magnetoresistive effect
sensor whereby a magnetoresistive effect film having a
25 basic configuration that is either a combination of a
free layer, a barrier layer formed on said free layer,
and a fixed layer, or a combination of a fixed layer, a
barrier layer formed on said fixed layer, and a free
layer formed on said barrier layer is formed either

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directly on a lower conductor layer or thereonto with an intervening base layer, and further wherein, said lower conductor layer being made of a material selected from a group consisting of an amorphous material and a

5 microcrystalline material.

17. A method for manufacturing a magnetoresistive effect sensor according to claim 16, whereby said lower conductor layer is formed by a microcrystal comprising a crystal grain diameter of 5.4 nm or smaller.

10 18. A method for manufacturing a magnetoresistive effect sensor according to claim 16, whereby said lower conductor layer is formed by sputtering.

19. A method for manufacturing a magnetoresistive effect film according to claim 11, whereby a layer fixing a
15 magnetization of a fixed layer is further formed, so as to be in contact with said fixed layer.

20. A magnetoresistance detection system comprising a magnetoresistive effect sensor according to claim 1, a means for generating a current passing through a magnetoresistive effect sensor, and means for detecting a change in magnetoresistance of said magnetoresistive effect sensor as a function of a detected magnetic field.

21. A magnetic recording system comprising a magnetic storage medium comprising a plurality of tracks for data recording, a magnetic recording system for storing data on said magnetic storage medium, a magnetoresistance detection system according to claim 20, and an actuating means lined to said magnetic recording system and a magnetoresistance conversion system for the purpose of

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causing said magnetic recording system and said magnetoresistance detection system to move to a selected track of said magnetic storage medium.

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